

BRITISH ROAD SAFETY STRATEGY TO 2010: TARGET SETTING, MONITORING AND RESEARCH

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ABSTRACT

As a key element in the British government's integrated transport policy, a comprehensive road safety strategy has as its focus casualty reduction targets for 2010. The strategy is presented in relation to ten themes and envisages addressing these through partnership with the relevant organisations and with road users in implementing new or enhanced policies for opening up or progressing further along twelve avenues of casualty reduction. The quantitative basis (in analysis of the likely effects of these policies, long term trends in casualty rates, and a range of possible levels and patterns of road use in 2010) is set out for advice to Ministers leading to their choice of casualty reduction targets for 2010 - 40 per cent fewer killed or seriously injured (including 50 per cent fewer children) and a 10 per cent lower rate of slightly injured per 100m vehicle-km than the averages for the five years 1994-1998. The same analysis provides a transparent basis for monitoring and periodic review of progress towards the targets. The strategy includes commitment to further research into various aspects of road safety, and these and other related research requirements are discussed.

1 BACKGROUND

Great Britain has had a road casualty reduction target since 1987, when, after an interdepartmental review of road safety, the then government set a target (1) of reducing the annual number of casualties by the year 2000 by one-third compared with the average for 1981-85. That target was accompanied by a review of means by which it might be achieved, but not by any strategy for implementing them. Nevertheless, the target attracted strong commitment from many agencies working for road safety, and by 1996 it was clearly likely to be more than achieved in terms of numbers killed or seriously injured (KSI), but beyond reach in terms of numbers slightly injured. The then government then consulted widely about whether there should be a subsequent target, and what form it should take (2). The response was emphatically that there should be a further target.

The present British government inherited in May 1997 the outcome of that consultation exercise. It was also committed to a new integrated transport policy emphasising sustainability, or rather reduction in unsustainability, upon which it soon launched a national consultation leading in July 1998 to a white paper (3). Ahead of drafting the white paper, however, the government announced in October 1997 that the integrated transport policy would include a road safety strategy with a target for the year 2010 as its focus. Two accompanying papers (4,5) set out how the strategy was to be developed and the target determined. This work was assisted by a review of speed policy, and research on traffic speed in relation to accident occurrence and on the numerical basis for setting the target. The strategy and the target for 2010 (6) were launched in March 2000, when the speed policy review (7) and the two pieces of research (8,9) were also published.

2 THE TARGET AND STRATEGY

The target is to reduce by 2010:

- ▲ the annual number killed or seriously injured by 40 per cent;
 - ▲ the annual number of children killed or seriously injured by 50 per cent; and
 - ▲ the number slightly injured per unit of vehicle-distance travelled by 10 per cent;
- compared with the average for the years 1994-1998.

The form of the target was a matter for decision by Ministers, and the professional advice provided to them to help them was based on a range of considerations, including experience with the target for 2000 set in 1987. The steady annual percentage decrease required to achieve the new target of a 40 per cent reduction in numbers KSI over 14 years (from 1996, the midpoint of the baseline period, to 2010) is similar to the annual percentage

reduction achieved in periods of average economic growth since the mid-1980s in pursuit of the previous target. The previous target was for a similar reduction in casualties of all severities, but the number of slight casualties has increased by about 15 per cent over the target period. The increase has been among car users, but at a lower rate than the increase in car use. Hence, in order for the new target for slight casualties to be positive yet realistic, it has been expressed as a reduction in rate per unit vehicle-distance travelled. To reduce the slight casualty rate by 10 per cent in the context of an increase in vehicle-use over the 14 years at the midpoint of the expected range requires the increase in numbers to be held to 12.5 per cent. This requires the rate of increase in numbers to be reduced somewhat compared with the rate that prevailed in periods of average economic growth since the mid-1980s

The higher target for reduction in the number of children KSI is a response to the fact that the annual number of child pedestrians KSI is about 50 per cent higher in relation to the child population in Great Britain than in most neighbouring countries, and about twice as high as in the best-performing northern European countries.

The strategy calls for many agencies and professions, business, road-user groups and the public to work together with central and local government in a wide range of ways, and to this end it is presented in terms of ten themes, or areas of concern and action. These are:

- | | |
|---|--|
| 1 safer road use for children | 6 safer vehicles |
| 2 safer drivers - training and testing | 7 safer motorcycling |
| 3 safer drivers - drink, drugs and drowsiness | 8 safer walking, cycling and horseriding |
| 4 safer infrastructure | 9 better enforcement of traffic law |
| 5 safer speeds | 10 promotion of safer road use |

The choice of themes is oriented towards outcomes in order to encourage participation in the effort needed to implement the strategy, but for each theme an action plan is presented, and these overlap in many ways in terms of the main means by which it is envisaged that casualties will be reduced, as discussed here in Section 4.

3 THE NUMERICAL BASIS FOR THE TARGET LEVELS

The method adopted (9) for developing advice to Ministers on the numerical levels at which the target should be set was influenced by two considerations. First, the integrated transport policy seeks deliberately to alter the trends of recent decades in road use by encouraging walking, cycling and the use of public transport whilst moderating growth in the use of cars. Secondly, the government had committed itself to 3-yearly reviews of progress towards the target and of priorities within the strategy, so that the numerical basis of advice on target-setting had to be transparent and the calculations repeatable in the context of the reviews.

Analysis had therefore to distinguish explicitly between the effects upon future casualty numbers of safety policies and of changes in use of the roads. Forecasts of future numbers of casualties were therefore made by

- forecasting casualty rates per unit of road use in the absence of new safety policies;
- applying these rates to a range of possible future scenarios for road use; and
- reducing the resulting forecast numbers of casualties to reflect the likely effects of new safety policies.

The safety policies considered in this context are discussed in the next section.

Since current numbers of casualties are affected by current safety policies, the first step was to investigate to what extent it was possible to estimate what current casualty numbers would have been in the absence of particular safety policies. This proved possible for three policies: measures to reduce drink-driving (D), road safety engineering schemes (E) and improved secondary safety in cars (SS). These three together were referred to as the *DESS measures*, and all other road safety policies taken together were referred to as the *core* road safety policies. As an example of the estimates made, results for car occupant casualties are shown in Table 1.

Table 1. Estimated percentage extra car-occupant casualties in 1998 if certain policies had not been in place since 1983

Type of policy	Percentage extra KSI	Percentage extra slight
Measures to reduce drink-driving (D)	10.6	8.9
Road safety engineering schemes (E)	6.5	6.5
Improved secondary safety in cars (SS)	14.7	-1.7
DESS measures in combination	35.1	14.1

The estimates for D were made by assuming that without these measures, casualties in accidents in which a driver was found to be over the alcohol limit would have continued to form the same proportion of all casualties as in 1983. The estimates for E were based on known total expenditure on schemes and observed cost-effectiveness of a sample of schemes. The estimates for SS were based on loglinear modelling of the proportion

of car-occupant casualties that are KSI in terms of year of occurrence and year of first registration of the car, and the known proportions of casualties in each year that were travelling in cars of each model year.

Adjusted casualty rates per unit vehicle-distance travelled could thus be estimated for each road user group for each year from 1983 onwards on the basis that only core road safety policies had been in place. The logarithms of the adjusted casualty rates were found to have changed roughly linearly over time. For each severity, rates of change were estimated for the whole period since 1983 and for the more recent period since 1991.

The linear trends in the logarithms of the two adjusted casualty rates for each road user group were extrapolated to 2010, using the rate of change estimated for the period 1983-1998 unless there seemed to be a strong reason for preferring the 1991-1998 estimate. For users of motor vehicles the relevant rate was casualties per unit vehicle-distance travelled by the type of vehicle being used. For pedestrians and cyclists, the rate was per unit vehicle-distance travelled by all motor vehicles, factored in proportion to the total distance walked or cycled respectively, except that for road-use scenarios in which the distance walked or cycled was assumed to increase considerably, that increase was raised to the power 0.6 to reflect the fact that large increases are unlikely to occur unless conditions for walking and cycling become safer than under a continuation of previous trends.

Adjusted casualty rates were thus forecast for 2010. They are estimates of the rates that might be expected in 2010 if core road safety policies continued until then as in the recent past, but there were no further DESS measures from now on. These rates were then reduced to reflect the estimated effect for the road-user group concerned of new road safety policies that could be implemented in addition to the core policies from now on.

The resulting rates were applied to road-use scenarios based upon the following range of assumptions about changes in use and the consequent levels of use in 2010 relative to those in 1996, having regard to the government's own national road traffic forecasts (NRTF) - which estimate (10) how motor vehicle traffic would increase without any of the growth-moderating policies envisaged in the integrated transport policy.

Walking and cycling

A* continuing to decrease at the same rate as recently	76 per cent of 1996
B remaining at the same level	100 per cent of 1996
C returning to the level of 1983	129 per cent of 1996
D showing major growth (cycling only)	300 per cent of 1996

*A, B, C, D are used in the key to Figure 1

Motorcycling

decreasing as it had until the early 1990s	75 per cent of 1996
remaining at the same level	100 per cent of 1996
increasing again	150 per cent of 1996

Car traffic

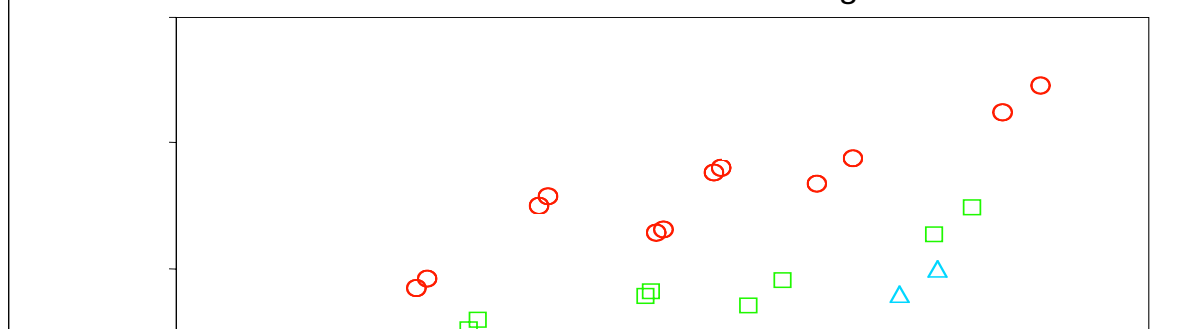
following the NRTF high forecast	135 per cent of 1996
following the NRTF central forecast	125 per cent of 1996
following the NRTF low forecast	115 per cent of 1996
returning to the 1996 level	100 per cent of 1996

Other motor traffic

with high growth in car traffic	135 per cent of 1996
with central growth in car traffic	132 per cent of 1996
with low or reversed growth in car traffic	130 per cent of 1996

Not all combinations of these possibilities were considered - it was assumed that large increases in walking and cycling would be associated only with more moderate or zero increase in car use. In this way the number of scenarios for walking, cycling and motor traffic was reduced to 12, and each of these was combined with each of the three possibilities for motorcycling (to reflect the volatility of motorcycling as a form of road use).

40% 45% 50% 55% 60% 85% 95% 105% 115% 125% forecast for slight casualties Fore-castfo



For each of the resulting 36 scenarios, the forecast KSI and slight casualty rates for each road-user group, together with percentage reductions to be expected for the road-user group concerned from new safety policies, were used to estimate total numbers of KSI and slightly injured casualties in 2010 under each scenario as percentages of the average numbers for 1994-1998. The results are shown in Figure 1, together with the implied changes in the slight casualty rate per unit vehicle-distance travelled under the four levels of growth in total motor traffic implied by combining the corresponding assumed percentages for car and other motor traffic.

It can be seen that Ministers have been quite cautious in setting the target for numbers KSI and rather bolder in setting the target for the slight casualty rate. Caution derives from the fact that the estimates are based on continuation of past trends and the implementation in full of a wide range of policies.

4 HOW THE CASUALTY REDUCTIONS ARE EXPECTED TO BE MADE

The reductions required to meet the targets are expected to stem jointly from two processes. First, the numbers KSI and the slight casualty rate should continue to fall with increased motorisation and associated adaptation by society, including the generally accepted core road safety policies and practice. This should provide a reduction of 20-25 per cent in the numbers KSI between 1996 and 2010. Secondly, the implementation of new policies and measures of twelve kinds, pursued as far as now seems practicable up to 2010, should reduce the number of KSI by 35 per cent by then. Combining these two reductions multiplicatively gives a reduction of about 50 per cent. The lower target of 40 per cent recognises that the past tendencies may not continue in every respect, and that not all of the envisaged policies may be able to be pursued to the full.

The twelve kinds of policies and measures reflect technical assessment of means by which casualty reduction can be achieved, and the following list indicates the percentage reduction in numbers KSI that has been assumed (9) to result from each of them in arriving at the forecasts shown in Figure 1.

1	New road safety engineering programme	7.7 per cent
2	Improved secondary safety in cars	8.6 per cent
3	Other vehicle safety improvements	4.6 per cent
4	Motorcycle and pedal cycle helmets	1.4 per cent
5	Safety on rural single-carriageway roads	3.4 per cent
6	Reducing accident involvement of novice drivers	1.9 per cent
7	Additional measures to protect pedestrians and cyclists	1.2 per cent
8	Additional measures to reduce speeds	5.0 per cent
9	Additional measures to protect children	1.7 per cent
10	Reducing casualties in drink-driving accidents	1.2 per cent
11	Reducing accidents during long-distance work driving	1.9 per cent
12	Additional measures for improved driver behaviour	1.0 per cent

These percentages combine multiplicatively to give the above-mentioned reduction of 35 per cent. There is no simple correspondence between the twelve kinds of measure and the ten themes of the strategy, because most measures contribute in various ways to addressing the concerns reflected in at least several of the themes, and each theme requires measures of several kinds to address it satisfactorily. The broad relationship between the themes and the kinds of measures can be discerned from general knowledge of the problem of road accidents, and further details are set out in the strategy (6).

5 SOME IMPLICATIONS FOR RESEARCH

The strategy is firmly based on findings from decades of research in Britain itself, elsewhere in the European Union and in other OECD countries, as exemplified by the content of the speed policy review (7). The strategy also identifies further research requirements and commits the government to addressing these.

The author sees the following as areas in which research should yield information of particular relevance to implementation of the ten themes of the strategy and achievement of the target for 2010.

- ▲ What makes routes for walking and cycling attractive to users, especially children and those accompanying them, and how can routes that are safe and attractive be created within existing communities?
- ▲ How to achieve higher levels of competence among novice drivers without causing substantial numbers of them to drive illegally because they perceive it to be too difficult to qualify for a licence?
- ▲ How to determine the influence of various drugs on accident involvement and then to reduce accidents that result from their use, and how to help drivers to avoid falling asleep at the wheel without restricting their lifestyles in unacceptable ways?
- ▲ How to redefine the functional hierarchy of roads so as to assist in urban and rural safety management, and how to realise the concept of the self-explaining road on which design, appearance and technology combine to cause road users to use it safely?
- ▲ How to set local speed limits on a rational and transparent basis which gains the compliance of a large majority of drivers?
- ▲ How to adapt the designs of large vehicles economically so that they are less injurious in collisions to pedestrians, cyclists and occupants of smaller vehicles?
- ▲ How to minimise the social and economic costs of the availability of motorcycling as a means of transport?

- ▲ How to monitor walking and cycling, including risk-related deterrence from walking and cycling, economically and unintrusively?
- ▲ How to estimate the value of improved compliance with traffic law and the effectiveness of enforcement activity in achieving this, and thus provide a rational basis for allocation of enforcement effort?
- ▲ How to communicate effectively about road safety with those whose behaviour it is in the greatest interest of road users as a whole to modify?

This is just one researcher's selection, in relation to the themes of the British government's strategy, from the wide range of challenges that still face road safety research at the start of the 21st century.

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Note: The websites of the DETR and TRL are <http://www.detr.gov.uk> and <http://www.trl.co.uk>
Further information about the author can be found at <http://www.ucl.ac.uk/transport-studies>